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Tyson Vaughan

Host, me

Chat

from Tyson Vaughan to everyone: 12:25 PM
Tyson Vaughan, USACE.

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ALA WAI FLOOD RISK MANAGEMENT GENERAL RE-EVALUATION STUDY

SUB-BASIN WORKSHOP 2: MĀNOA

US Army Corps of Engineers (USACE)
City and County of Honolulu (CCH)

8 April 2022

***This session is being recorded.**



US Army Corps
of Engineers®



Eric Tessmer (2017)



Cory Lum, *Civil Beat* (2015)



SCHEDULE: SUB-BASIN WORKSHOPS



1. April 1, 2022 (F): Makiki and Pālolo Sub-basins
- 2. April 8, 2022 (F): Mānoa Sub-basin**
3. April 14, 2022 (Th): Ala Wai Canal and Lower Watershed
4. April 22, 2022 (F): Continued discussion; focus TBD



HIGHLIGHTS: MAKIKI & PĀLOLO WORKSHOP



1. Constructive interest and engagement
2. Questions:
 - a. What is the design storm? (50-year? 20-year? etc.)
 - b. Which area or neighborhood are you intending to protect?
3. Significant concern about debris management and stream maintenance
4. Continued interest in SWIFT tunnels
5. Storage areas that do *not* require pumps should be prioritized
6. Several additional measures proposed
7. Received information about loi kalo



TODAY'S AGENDA: MĀNOA



1. Introduction (5 min) ← You are here!
2. Presentation (20 min)
3. Breakout discussion setup (3 min)
4. Facilitated breakout discussions (40 min)
5. Wrap-up (2 min)



HOSTS & DISCUSSANTS



Presenters (USACE):

- **Eric Merriam**, PhD, PMP; Planner; *Study Lead*
- **Cindy Acpal**, Project Manager

MC / Lead Facilitator (USACE):

- **Tyson Vaughan**, PhD; Sociologist

Additional Facilitators (USACE):

- **Kelley Philbin**, PE; Engineer; *Technical Lead*
- **Ben Reder**, Project Manager

Discussant (USACE):

- **Jeffrey Herzog**, Deputy Chief, Civil and Public Works

Discussants (CCH):

- **Alex Kozlov**, PE; Director, Department of Design and Construction, City & County of Honolulu
- **Haku Milles**, PE, LEED AP; Deputy Director, Department of Design and Construction, City & County of Honolulu
- **Matthew Gonser**, AICP, CFM; Chief Resilience Officer, Office of Climate Change, Sustainability and Resiliency, City & County of Honolulu



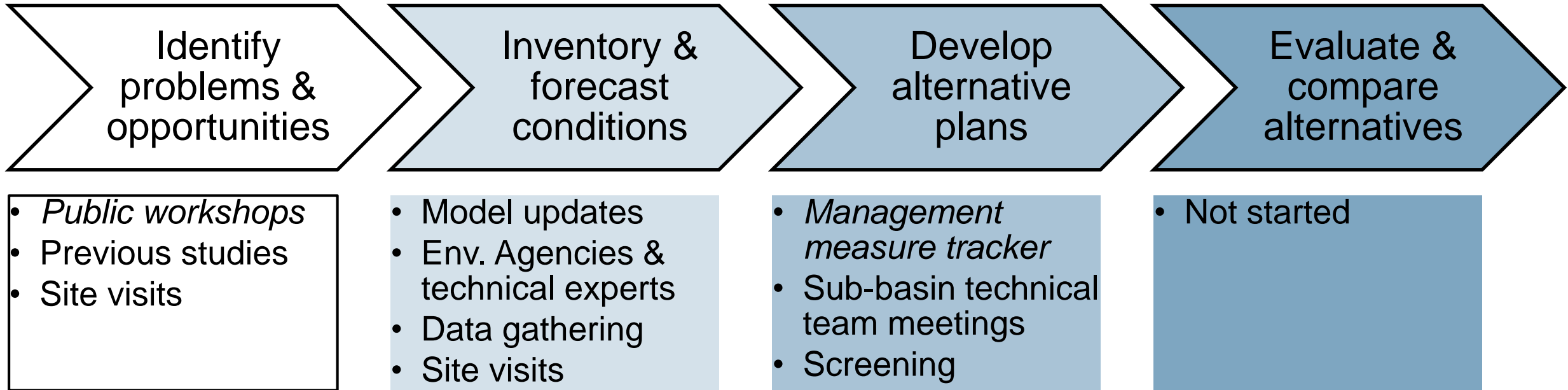
GROUND RULES: PRESENTATION



1. Post comments and questions in the chat, or hold until breakouts.
2. Keep your audio on mute during the presentation.
3. If you are having technical difficulties, let us know via the chat and/or email to Tyson Vaughan: Earl.T.Vaughan@usace.army.mil.



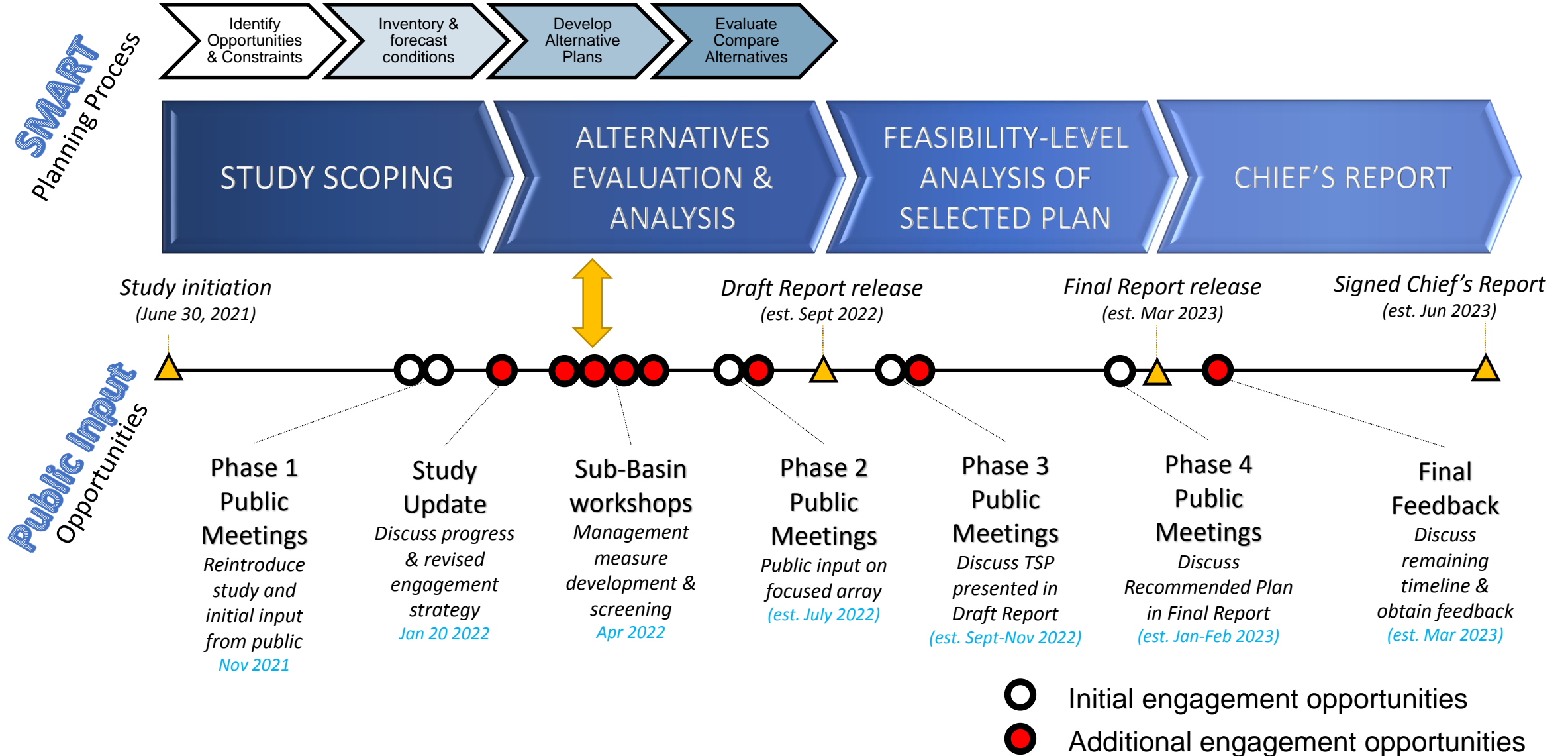
STUDY PROCESS & PROGRESS



Progress Since Last Public Information Meeting:

- Hydrologic & hydraulic model updates and calibration
- Completed sub-basin management measure development meetings
- Initial round of management measure screening (ongoing)
- Technical team site visit from March 21-24

STUDY PROCESS & PROGRESS





MANAGEMENT MEASURE TRACKER

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Management measure tracker:

- Available at:

<https://www.honolulu.gov/alawai/resources.html>

- Updated prior to public meeting
- Focused, real-time feedback on technical & planning process

208 measures being tracked

- 48 screened from further consideration
- 160 still under consideration

Meetings will not cover all measures

Analyses will be ongoing & updated in tracker

Ala Wai Flood Risk Management GR Study - Management Measure Tracking Spreadsheet
last updated: March 31, 2022

Tracking #	Measure Name	Location	Description	Status	Notes/Rationale
1	Flap gates on storm drains	Ala Wai Blvd. between Kalakaua and Ala Moana Blvd.	During high tide Ala Wai Blvd. between Kalakaua and the cul de sac ending at Ala Moana Blvd. floods. Ala Wai canal in this area needs flap gates to keep Ala Wai Canal water from flooding storm drains and flooding streets.	Under consideration	Provision, modification, and/or maintenance of drainage systems to capture and convey interior runoff in urban areas is a non-Federal responsibility and therefore cannot be included in a recommendation made as a result of this general reevaluation report. However, this study can make modifications to natural stream channels or previously modified natural waterways that help reduce backup within adjacent drainage systems.
2	Elevate canal walls	Ala Wai Canal	Increase canal capacity by elevating the existing canal floodwalls	Under consideration	
3	Deepen the canal	Ala Wai Canal	Excavate to deepen the existing canal and stabilize existing floodwalls.	Screened Out	Dredging to the maintenance elevation is encouraged for the City to maintain consistently. Deepening the canal further than the maintenance elevation is generally not recommended due to the stability of canal walls and slope stability. Increasing storage of the canal can technically reduce flooding but not without instability of the structural components of the bridges and canal walls. The integrity of the canal walls as-is would not withstand excavation - only replacing with an entirely new system would. Further analysis is needed to determine the stability of bridge pier and footings. See measure 5.
4	Deepen canal for periodic pump drainage	Ala Wai Canal	Dig existing walls deeper to turn the canal into a periodic pump drainage to address inundation by all three sources of flooding	Screened Out	Digging the existing walls deeper is not recommended due to their structural integrity. Pumping the canal to increase storage capacity is not recommended due to stability of the existing canal walls. Hydrostatic pressure is likely needed for structural stability. Technical analysis needed to determine structural stability of bridge piers and footings. See measure 5.
5	Deepen the canal, replace canal walls with higher flood protection	Ala Wai Canal	Dredge canal down to its original depth of 15' to 25', and replace the degraded infrastructure with new canal walls that are set for greater flood protection	Under consideration	The integrity of the canal walls as-is would not withstand greater dredging efforts than maintenance dredging - only replacing with an entirely new system would. Further analysis is needed to determine the appropriate wall height, the stability of bridge pier and footings, and the optimal depth that balances slope stability and flood storage.
6	Widen canal	Ala Wai Canal	Widen the canal to provide greater flow and storage capacity.	Under consideration	Widening the canal in strategic locations, namely at the Eastern end of the canal, could provide more flood storage. Further analysis is needed. Widening the canal for the entire length would require extensive real estate acquisitions with significant costs. Expanding canal storage through the use of floodwalls and/or utilizing existing storage areas along the canal (e.g., golf course, Ala Wai Community Park) are likely more efficient and are considered elsewhere.
7	Dredge Ala Wai Canal to original depth	Ala Wai Canal	Dredge canal down to its original depth of 15' to 25' since current dredging only goes down to 12'.	Screened Out	Dredging to the maintenance elevation is encouraged for the City to maintain consistently. Deepening the canal further than the maintenance elevation is generally not recommended due to the stability of canal walls and slope stability. Increasing storage of the canal can technically reduce flooding but not without instability of the structural components of the bridges and canal walls. The integrity of the canal walls as-is would not withstand excavation - only replacing with an entirely new system would. Further analysis is needed to determine the stability of bridge pier and footings. See measure 5.
8	Dredge Manoa-Palolo Channel	Manoa-Palolo Channel	Dredge the Manoa-Palolo channel	Under consideration	
9	Canal clean ups	Ala Wai Canal	Involve the community to conduct regular clean ups	Screened Out	Organizing clean-ups is outside the scope of the current study. Community involvement for clean ups after construction is a possibility; however, those initiatives those initiatives need to be initiated by other entities.
10	Effective Microorganisms (EM) to eliminate sludge	Ala Wai Canal	Use "genki balls" to clean up and eliminate sludge in the canal. These healthy microorganisms work to digest sludge in the canal which will help not only to evacuate water from the canal quicker, but also restore the ecosystem and reduce frequency for dredging.	Screened Out	Sludge eliminated by the genki balls would have to be extensive enough to reduce flood risk in order to be justified under the current study. Genki balls would eliminate the organic matter within the canal, which only makes up a small portion of material within the canal. Genki balls as a standalone measure would not provide enough reduction in material to increase storage capacity of the canal and reduce flood waters. Genki balls could be incorporated into a separate effort focused on ecosystem restoration.
11	Oysters to clean the canal	Ala Wai Canal	Use oysters as filters to clean the canal waters.	Screened Out	Improving water quality is outside the scope of this project. Debris management will likely be most effective when utilized in conjunction with other measures (e.g., combined storage/debris management basins; structural modifications to bridges).
12	Debris management	Watershed wide	Better manage the debris that ends up in the canal	Under consideration	
13	Submersible pumps	Ala Wai Canal	Use underwater pumps to create a lower profile pumping station	Under consideration	
14	Miter gates	Ala Wai Canal	Use several smaller radius miter gates to minimize visual impacts (to be used in conjunction with pump station)	Under consideration	
15	Lowered gate structure	Ala Wai Canal	Use a lowered structure underwater that could be raised in an event instead of a miter dam. (to be used in conjunction with pump station)	Under consideration	
16	Retractable flood barriers	Ala Wai Canal	Relocate pump station to the golf course. Use a series of retractable flood barriers that would allow for 4 rowing lanes (44' wide) across the width of the canal.	Under consideration	

NOTE: Only displaying measures 1-16 of 208 total.



Iteration 1 (Complete)

Screening criteria:

- Study Authority – Is it within study authority?
- Technical Feasibility – Is it technically feasible?
 - Existing data and conditions, engineering standards and best practices

Iteration 2 (Ongoing)

Screening/tiering criteria:

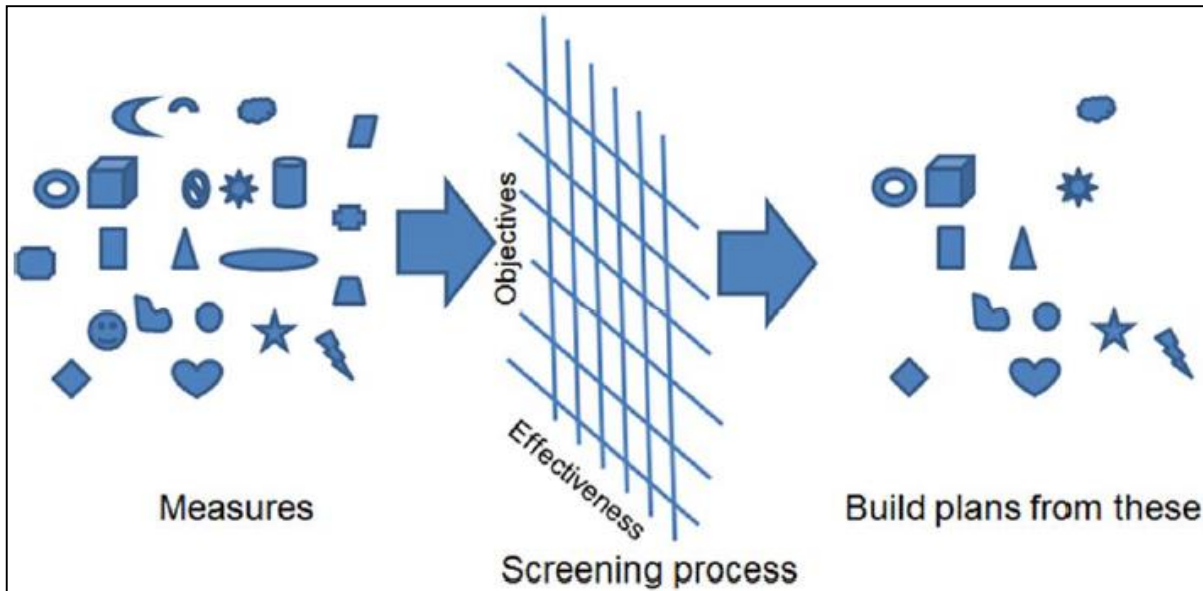
- Effectiveness – Extent it would reduce life risk and/or economic damages.
- Efficiency – Expected cost-effectiveness.
- Environmental Considerations – Benefits/impacts.

Existing models/data: water volumes, expected damages, high-level costs

Tiering to prioritize analyses:

- Tier 1: Highest analytical priority. Results could screen other measures.
- Tier 2: Assessed after Tier 1 measures.
- Tier 3: Assessed after Tier 2 measures.

Not a hierarchy of importance. Allows team to maximize efficiency. All measures will be assessed.







MANOA NONSTRUCTURAL, NATURAL & NATURE-BASED

No.	Measure Name	Notes	Status / next steps
65 91 92	Forest/Invasive Management	Modeling will be conducted to quantify the extent to which forest management reduces flood risk.	Tier 1 for hydrologic modeling
104	Decrease imperviousness	Modeling will be conducted to quantify the extent to which decreasing impervious surfaces throughout the watershed reduces flood risk.	Tier 1 for hydrologic modeling
179	Permeable Pavement at Manoa Marketplace	Replace parking lot with permeable pavement to reduce direct runoff contributing to flows down Woodlawn Drive	Under consideration
184	Nonstructural measures	Potential for nonstructural measures (e.g., elevation, floodproofing, relocation, flood warning systems) will be assessed once economic models are finalized.	Tier 1 for economic modeling
96 97 188	Debris Management	Modeling to assess potential problem areas for debris buildup will be completed first. Specific management measures will then be identified.	Under consideration
83 112 114 124	Wetlands, agriculture	Storage requirements and potential will be modeled initially. Potential for incorporation of wetlands and/or agricultural features will then be assessed.	Under consideration
169	Manoa Channel Naturalization	Return channel to a more natural state by removing concrete and replace with natural slope material	Under consideration

‘Under consideration’ indicates that it has not yet been assessed under the second screening iteration to-date.

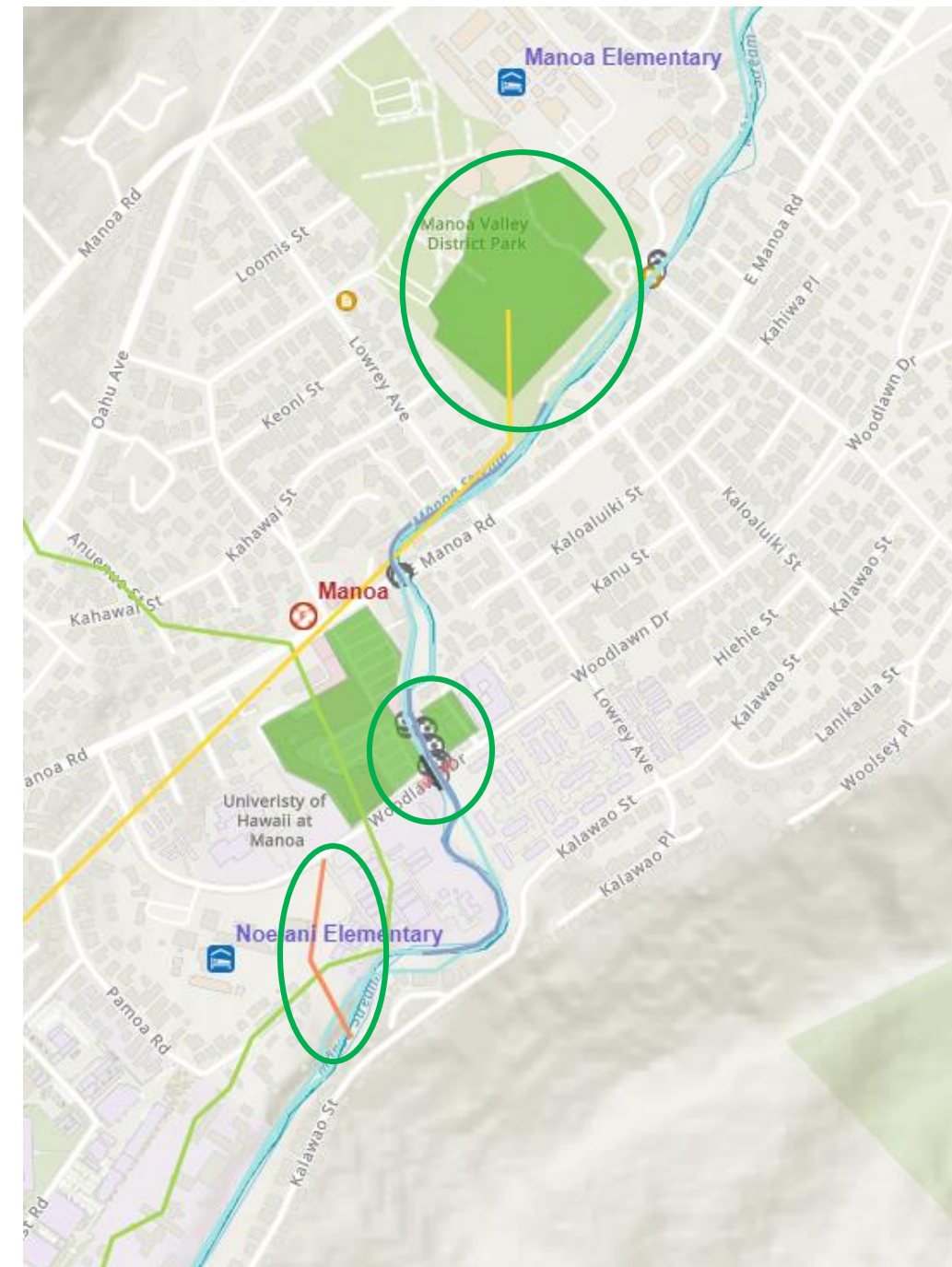


Manoa Stream Above E. Manoa Road



MANOA MEASURES: STRUCTURAL

No.	Measure Name	Notes	Status
76	Manoa Park Detention Basin	Use Manoa Valley District Park as a detention basin to capture peak flooding and slowly release to watershed below.	Tier 1
69	Kahaloea Bridge widening	Widen the Kahaloea bridge to allow a larger volume of storm water drainage runoff feeding into Manoa Stream just above the bridge.	Under consideration
166	Woodlawn Bridge Modification	Raise bridge to prevent debris buildup	Tier 1
167	Woodlawn Drive Bypass	Capture overflow water from Woodlawn Drive and return to stream	Tier 1
71	Woodlawn Bridge bypass box culvert	Create a bypass box culvert that traverses around both bridge abutments and exits into the existing stream channel. Increase the number and size of catch basins and drain pipes.	Tier 1
129	Increase stream capacity	Widen the stream or build floodwalls to increase stream capacity near the Woodlawn Bridge	Tier 1
175	Manoa Innovation Center Parking Lot Storage	Use natural floodplain/parking lot to contain flood waters and store water	Tier 1
70	Drop structure	Install a "falls" just before the bridge at Woodlawn Drive to help push the silt and debris past the bridge to prevent future floods.	Under consideration
176	Woodlawn Bridge Floodwall	Floodwall (permanent or deployable) at Woodlawn Drive Bridge vicinity to contain water to channel	Under Consideration





Top Left: Manoa Valley District Park
Bottom Left: Kahaloa Drive Bridge
Top Right: Woodlawn Bridge



MANOA MEASURES: STRUCTURAL CONT.

No	Measure Name	Description	Status
57	Kanewai Detention basin	Use Kanewai as a detention basin (preference for underground detention)	Tier 1
90	UH practice fields detention basin	Pipe floodwaters to the UH practice fields for additional storage	Tier 3
183	Kalaepohaku Ridge Underground Detention	Large underground storage tank on the embankment of the Kalaepohaku Ridge	Screened
55 56	Kanewai detention & bypass conduit	Detention basin at Kanewai Community Park and a conduit that bypasses Manoa-Palolo and Ala Wai canal.	Under consideration
177	Koali Rd. Floodwall	Floodwall along left bank of Manoa Stream, downstream of Kanewai Community Park to protect community from upstream peak flows	Under consideration



UH Practice Fields



Kanewai Community Park

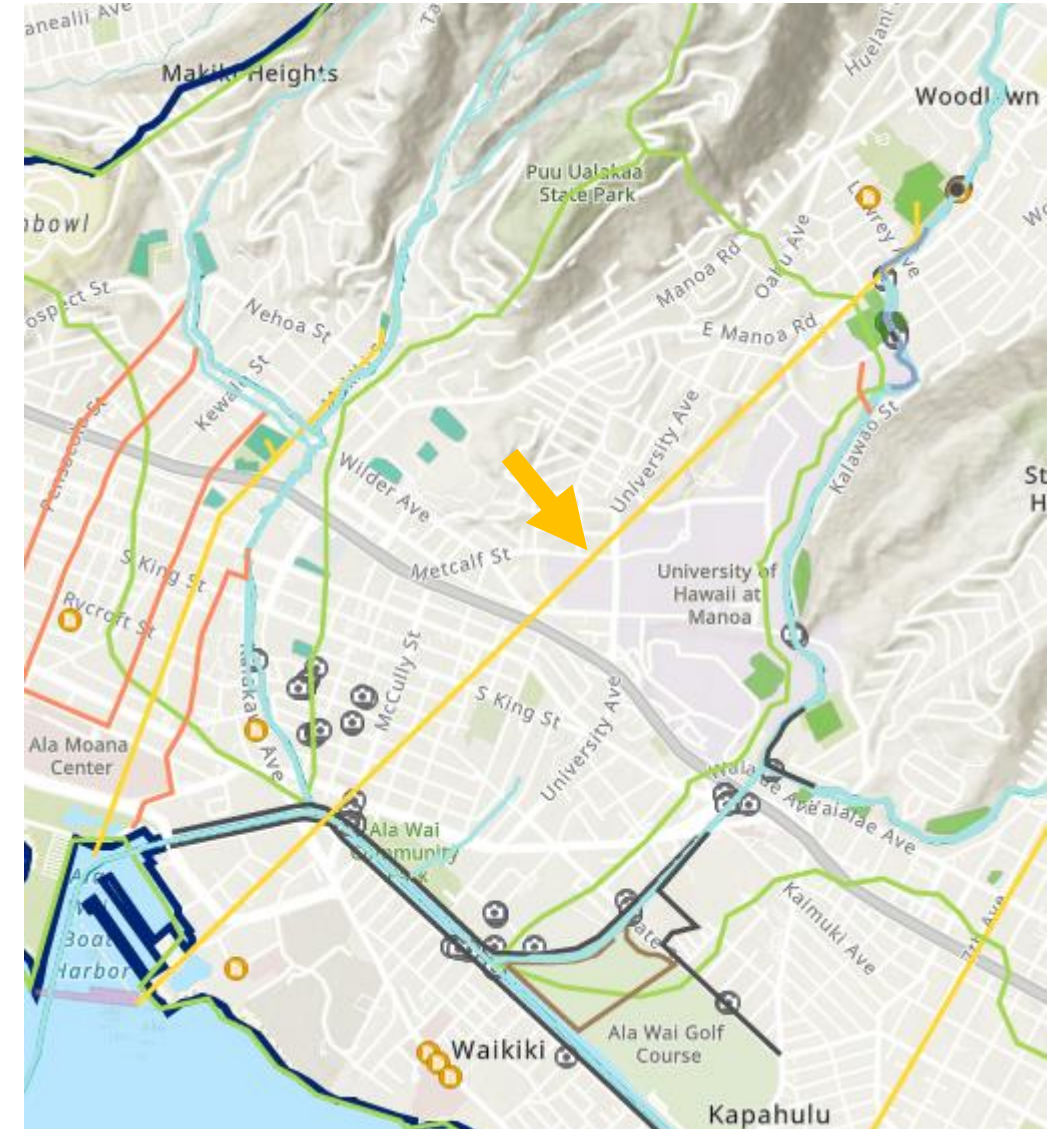




MANOA MEASURES: STRUCTURAL CONT.



No	Measure Name	Description	Status
66 180	SWIFT tunnels	Two 12' diameter subsurface tunnels (~40' under) from Manoa and Palolo shooting straight out to sea using gravity flow	Tier 3
67	Install baffling in streams	Install baffling in the streams to slow the water down.	Under consideration
68	Check dams	Construct check dams in Manoa to slow the water down ahead of areas prone to flooding	Under consideration
72	Manoa Stream Dredging	Annually dredging Manoa Stream from where the stormwater drainage ditch feeds into the stream from the Woodlawn Street drainage to the end of the stream area at the end of the Manoa Valley District Park	Under consideration
168	Manoa Channel Modification	Deepen/Widen channel to provide more within-bank storage	Under consideration





DISCUSSION GROUPS



Webex main room. (here)

Facilitator: Ben Reder

Discussion group 1.

Facilitators: Tyson Vaughan and Kelley Philbin (technical lead)

Discussion group 2.

Facilitators: Eric Merriam (study lead) and Cindy Acpal (project manager)



QUESTIONS FOR YOU



1. What questions do you have about the screening process?
2. What questions do you have about specific measures described today?
3. What questions do you have about other measures not mentioned yet?
4. Have we captured measures appropriately thus far?
5. Are we still missing any additional measures for this sub-basin?



GROUND RULES: DISCUSSION GROUPS



1. Post comments and questions in the chat or use the “raise hand” tool.
2. Keep your audio on mute unless speaking.
3. Introduce yourself briefly the first time you speak.
4. When speaking, be conscious of acronyms and technical language.
5. Be mindful and help ensure that others have a chance to speak.



MAHALO



Thank you for your participation! Please stay engaged:

- Email the project team: AlaWai@Honolulu.gov.
- Post more ideas on Crowdsource Reporter! (until April 30)
<https://lrp.maps.arcgis.com/apps/CrowdsourceReporter/index.html?appid=df9e77cff6454945ad3dc75716a044ec>
- Check the project website: <https://www.honolulu.gov/AlaWai>.
 - Sign up for additional meeting notifications
 - Updated management measure tracker
 - Updated FAQs
 - Comment form
 - Link to Crowdsource Reporter